## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| Title: | MAIL IMAGE PROFILING AND HANDWRITING MATCHING | | |

Re: Response to Office Action of November 22, 2006

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## RESPONSE/AMENDMENT A UNDER 37 C.F.R. § 1.111

Sir:

In response to the Office Action dated November 22, 2006, please enter the following amendment.

**Amendments to the Drawing** begin on page 2 of this paper.

**Amendments to the Specification** begin on page 3 of this paper.

**Amendments to the Claims** are reflected in the listing of claims which begins on page 16 of this paper.

**Remarks** begin on page 24 of this paper.

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## Amendments to the Drawing

Applicants herein provide Replacement Sheets for Figures 3, 6, and 7.

## Amendments to the Specification

Please replace paragraph 21 in the specification with the following amended paragraph 21.

[0021] A flow chart of an embodiment of the method of this invention is shown in Figure 1. Referring to Figure 1, image characteristics 20 for a mail piece being examined are obtained (step 30, Figure 1) from an Image reading and Processing Center (2, Fig. 3; in one embodiment, a Remote Computer Reader- RCR). The RCR (Remote Computer Reader) 2 is a key site-centralized system that processes letter mail images for the purpose of address resolution - reading address text and deriving delivery point postal (ZIP) codes. (As a central processing point for all images lifted by mail transport and scanning systems, such as AFCS, MLOCR, and DIOSS transports, RCR is a logical central source for archiving letter mail images, enabling their later retrieval for investigative purposes. (8, Fig. 3)) A threat profile 40 is then retrieved from a profiling configuration file or database (step 45, Figure 1). In one embodiment, the threat profiles 40 are maintained in a Profiling Configuration File (5, Fig. 3) stored in the RCR system 2. The Profiling Configuration File (5, Fig. 3) can be created at and downloaded from an Image Inspection System Server (17, Fig. 3) through a network (12, Fig. 3). (The term "image characteristics," as used herein below refers to one or more image characteristics.) The threat profile 40 is then compared to the image characteristics 20 (step 50, Figure 1) in order to determine whether the image characteristics match the threat profile (step 60, Figure 1). If the threat profile 40 matches the image characteristics 20, the mail piece is identified for special processing (step 80, Fig. 1). ("Matching a threat profile" as used herein below can include taking account the severity of the profile. Thus, in some embodiments the image characteristics are compared to one or more profiles.) If the threat profile 40 does not match the image characteristics 20, another threat profile is then retrieved and compared to the image characteristics. If all of the threat profiles 40 do not match the image characteristics 20 (step 65, Figure 1), normal mail processing continues (step 70, Fig. 1 and step 15, Fig. 3).

Please replace paragraph 27 in the specification with the following amended paragraph 27.


[0027] In one embodiment, the remote image reading and processing (RCR) system 2 can perform "Front-end" and "Back-end" image processing (see Figure 3). For "Front-end" processing, the remote image reading and processing system (RCR) 2 receives and analyzes an image while the mail piece is in flight on a mail transport (such as a MLOCR or DIOSS transport) (26, Fig. 3). The result message from the remote image reading and processing system (RCR) 2 is normally used to indicate the destination postal (ZIP) code result achieved by address recognition processing of the remote image reading and processing system (RCR) 2. In this embodiment, this result message may be modified or augmented to indicate that a mail piece fits a "Profile" as described earlier. This special result, which could take the form of a reserved postal (ZIP) code, could be used to sort the "Profiled" mail to special bins for subsequent special handling or manual inspection (3, Figure 3). This approach is practical only for very accurate high-resolution profiles, such as detection of a letter from a specific return address. The approach is impractical for profiles based on characteristics that are coarse or subject to inaccuracies, as the volume of mail out-sorted for special handling may be too high. For profiles based on characteristics that are coarse or subject to inaccuracies, a preferred alternative involves routing the "Profiled" mail piece to "Back-end" processing at the remote image reading and processing system (RCR) 2, as discussed below.

Please replace paragraph 28 in the specification with the following amended paragraph 28.


[0028] In this embodiment, the "Back-end" processing at the remote image reading and processing system (RCR) 2 occurs while mail is in trays waiting for the next (in one embodiment, RBCS) processing step (28, Fig. 3). Normally, the result from "Back-end" processing is used to determine whether video coding of an image must occur to determine the destination result address. The video coding occurs at remote (REC) sites. As in the case of "Front-end" processing, the result record obtained from the remote image reading and processing system (RCR) may be modified to indicate that a mail piece fits a "Profile". For "Back-end" processing at the remote image reading and processing system (RCR), two scenarios for handling "Profiled" mail pieces may be implemented. Mail pieces fitting very accurate high-resolution profiles (again, the example of detecting a specific

return address) could be flagged immediately as requiring manual inspection or neutralization. The mail pieces matching very accurate high-resolution profiles may be identified, through barcodes or other means, so that the mail pieces can be out-sorted for inspection (or neutralization) on its next transport pass (for example, on an OSS or DIOSS transport).

Please replace paragraph 29 in the specification with the following amended paragraph 29.

[0029] For coarse profiles (e.g., mail pieces without a return address) (34, Fig. 3), indication of a profile match at the remote image reading and processing system (RCR) 2 may cause the image to go to a remote (REC) site for manual image inspection (4, Figure 3). Specifically, a special "Security Desk" at another remote (REC) site 4 could be created to screen images flagged by the remote image reading and processing system (RCR) 2 as fitting a profile. The specially trained individual screening the profiled images would have access to up-to-the minute investigative information allowing the image to be further classified as innocuous or suspicious enough to warrant physical inspection or neutralization of the mail piece. Images classified as innocuous would require no further address keying if the remote image reading and processing system (RCR) 2 had resolved the destination address.

Please replace paragraph 39 in the specification with the following amended paragraph 39.

[0039] Several characteristics, but not limited to these, relevant to classifying a mail piece as threat-consistent from analysis of mail piece images are described below in terms of the differing degrees of effectiveness, accuracy, image type, and processing power required.

1) Barcodes (90, Fig. 5) and identifying marks (85, Fig. 5) (in one embodiment, FIM, POSTNET & PLANET). The remote image reading and processing system (RCR) 2 currently detects the presence of the four different facing identification mark 85 (FIM) types. This function is very accurate on most images, unless the mark (FIM) is obscured by stamps or cancellation marks. The barcodes 90 (POSTNET and PLANET) are effectively and accurately detected and decoded at the remote image reading and processing system (RCR) 2. The identifying marks 85 (FIM) and barcode 90 reading

capabilities enable definition of mail profile characteristics (24, Fig. 3) based not only on presence or absence of these barcode types, but also on exact matches against specific values.

2) Destination Address Style. In one embodiment, the remote image reading and processing system (RCR) 2 detects multiple candidate address blocks (groupings of text that appear to have the form of a multi-line text address) on each letter image, and classifies each block as to the probability that it is a return or destination address. A byproduct of the optical character recognition (OCR) process on an address block is a coarse characterization of print style:

- Machine Printed Styles – Sub-styles for Machine Print are Machine solid, Machine broken, and Machine dot-matrix.

- Handwritten Styles - Sub-styles for handwritten are hand-printed and cursive. The categorization of sub-styles is more accurate for machine print addresses than for handwritten addresses.

- Skew - A coarse indication that pronounced skew of address text (where skew refers to a pronounced deviation from horizontal, i.e., from parallelism to the envelope bottom edge) exists may be obtained.

3) Destination Address Resolution. In one embodiment, the remote image reading and processing system (RCR) resolves the mail piece destination address from the envelope image, determining the finest-depth 11-digit postal (ZIP) code that corresponds to the address text. The remote image reading and processing system 2 (RCR) address resolution is performed in conjunction with address directory files created from previously obtained source data and refreshed weekly at each the remote image reading and processing system 2 (RCR) site, so the remote image reading and processing system 2 (RCR) address information is always up to date. A mail piece characteristic indicating that the destination address postal (ZIP) code resolved by the remote image reading and processing system (RCR) 2 matched any from a list of target postal codes (ZIPs) can be immediately provided. The matching process may support a wild card character (*) allowing a truncated comparison (e.g., for a 5-digit ZIP match).

4) Return Address Style. The classification of return address style at the remote image reading and processing system 2 (RCR) is similar to that described for destination address resolution.

5) Return Address Resolution. Return address resolution (including handwritten return address resolution) may support the following mail piece characteristics:

- Postal Code (ZIP) Match - against a list of postal codes (ZIP) (22, Fig. 3) in a configuration file, with wild-card support, allowing truncated comparison (e.g., for a 5-digit ZIP match).

- Invalid Return Address - indicating whether a match can be found in a postal code (ZIP+4) address database. The text return address block (as two separate characteristics). This indication is coarse, as false indications of an invalid address may be asserted due to incorrect OCR results.

- Invalid Delivery Point - indicating that while the text return address is consistent with the postal code (ZIP+4) address data, no match can be found in a more detailed address database. The data in the more detailed address database specifically identifies individual delivery points (e.g., each house on a street) rather than just a range of addresses as is contained in the postal code (ZIP+4) data. A randomly chosen house number for a valid street has a reasonable probability of being detected by this comparison.

- Non-local Return Address - Two embodiments of methods for providing a reliable indication as to whether the return address is not local (that is, is inconsistent with the collection point) are described below. These methods may be implemented at the remote image reading and processing system (RCR). A return address anomaly, such as a mail piece with a New Jersey return address that was evidently inserted into the mail stream in Florida, could be identified by one of the methods discussed below.

    − In one embodiment the consistency between the return address and the location of the mail processing transport that first processed the mail piece is examined. For each mail piece, the remote image reading and processing system (RCR) receives ID Tag information containing an identification number (ISS #, a number that uniquely

identifies a specific MLOCR, DIOSS, or AFCS transport, throughout the nation) of the transport that first processed the mail piece. At the remote image reading and processing system (RCR) 2, the ID TAG ISS# is compared to a static table associating identification numbers (ISS#s) to the Sectional Center Facilities (identified, in one embodiment, by the first three digits of a postal (ZIP) code) served by the transports.

— In a second embodiment, the consistency between the Return Address and the postmark on the mail piece is examined. The ID TAG comparison described above in the first embodiment utilizes existing information. Obtaining the information contained in the image of postmark on the mail piece requires additional image processing.

6) Envelope Size & Skew.

- Envelope Size - At the remote image reading and processing system (RCR) 2, a "cropping" function detects the height of the mail piece in the image and excludes any overscan areas. Envelope length is detected directly by the number of scan lines contained in the image (nominally 212 scan lines per inch). In this embodiment, the envelope dimensions are used to characterize the envelope size (e.g., business envelope, personal envelope) or to support specific tests for envelope height and width. The camera scan height (approximately 4.5" for presently utilized cameras) limits the maximum range of envelope height detection.

- Envelope Skew - Envelopes containing powder or other bulky contents may have a tendency to skew on the mail processing transports. In one embodiment, the skew is detected utilizing the bi-tonal image of the mail piece. In another embodiment, grayscale image processing may be used to detect envelope skew.

7) Postage characteristics. The following embodiments, but not limited to, can be used to identify postage characteristics:

- Postage Type - A postage type classifier, based on neural net technology, may be integrated into the remote image reading and processing system (RCR) to distinguish the following postage types:

  — Stamp

- Metered

- Pre-printed

- Embossed

Effectiveness and accuracy may initially be limited to a coarse classification, with moderate accuracy, since the mail pieces whose images are captured on present mail processing transports have cancellation markings over the postage. Use of grayscale images would allow higher accuracy of classification.

- Excessive Postage - The following embodiments, but not limited to, can distinguish instances of probable excessive postage. An assessment of the extent and shape of the postage area may be obtained from image processing of the binary (bi-tonal) images. Combined with the neural net technology described above for determining Postage Type, this method could assess the probability of presence of multiple stamps. The result is a probabilistic indication of excessive postage.

A more precise determination of the postage amount on an envelope requires processing grayscale images in order to recognize in detail specific stamp images and their amounts.

8) Restrictive Markings - The possible presence of restrictive text such as the words "Personal" or "Confidential" may be detected by means of image character recognition. In some embodiments, the image processing could be performed at the remote image reading and processing system (RCR) 2. For handwritten marks, the detection would require handwriting analysis and may be more appropriately performed offline. For machine printed mail, optical character recognition results, usually obtained at the remote image reading and processing system (RCR) 2, enable searching machine printed text for keywords (32, Fig. 3).

9) Clear Zone Infringements - Several embodiments, but not limited to, of methods for detecting Clear Zone Infringements are disclosed below. Referring to Figures 2 and [[5]] 4, the bottom band of envelope images seen by the remote image reading and processing system (RCR) 2 is normally clear, as this is the area in which a (POSTNET) barcode 90 is printed after the remote image reading and

processing (and video coding if applicable) is completed. Different infringements to the clear area could be detected in both binary and gray images by the methods described herein below.

- <u>Destination Address Infringement</u> - Referring to Fig. 2, the letter 10 exhibits a handwritten address block that infringes on the clear zone at the bottom of the envelope and on the barcode 90. The coordinates of a bounding box for each candidate address block found in the image are obtained by image processing. Infringement of the address block on the clear zone can also be detected by image analysis.

- <u>Stain.</u> Stains from settling of chemical compounds may be visible as noise in the bi-tonal image of the front of the envelope used for optical character recognition (OCR) processing. The image of the mail item, and in particular the bottom of the image (bottom of the envelope), may be analyzed by means of image processing techniques in order to classify the area as "Not Clear", possibly indicative of a stain. More definitive analysis may be performed on gray images. In one embodiment, the analysis may be performed at the remote image reading and processing system (RCR) 2.

Handwriting Matching - Handwriting analysis may be utilized to compare handwriting on images of mail to one or more reference images of evidence documents. The result of this comparison can produce a similarity score that could be thresholded to identify mail pieces that may have been penned by the author of the evidence mail piece.

Table 2: Image-Detectable Mail Piece Characteristics

| Characteristic | Categories | Image Type | Detection Rate | Accuracy |
|---|---|---|---|---|
| | | | | |

| Characteristic | Categories | Image Type | Detection Rate | Accuracy |
|---|---|---|---|---|
| 1) **FIM, POSTNET, & PLANET Barcodes** | • FIM presence & type<br>• Barcode type<br>• Barcode field match (against list) | Bi-Tonal | High | High |
| 2) **Destination-Address Style** | • Handwritten (any form) | Bi-Tonal | Moderate | Moderate |
| | • Hand printed<br>• Hand cursive | Bi-Tonal | Moderate | Moderate |
| | • Machine printed (any form) | Bi-Tonal | Moderate | Moderate |
| | • Machine solid<br>• Machine broken<br>• Machine dot-matrix | Bi-Tonal | Moderate | Moderate |
| 3) **Destination Address Resolution** | • Zip Match (against a list of ZIPS) | Bi-Tonal | High | High |
| | • Mis-spelled words (MP) | Bi-Tonal | Low | Moderate |
| 4) **Return-Address Style** | • Not present | Bi-Tonal | Moderate | Moderate |
| | • Handwritten (any form) | Bi-Tonal | Moderate | Moderate |

| Characteristic | Categories | Image Type | Detection Rate | Accuracy |
|---|---|---|---|---|
| | • Hand printed<br>• Hand cursive | Bi-Tonal | Moderate | Moderate |
| | • Machine printed (any form) | Bi-Tonal | Moderate | Moderate |
| | • Machine solid<br>• Machine broken<br>• Machine dot-matrix | Bi-Tonal | Moderate | Moderate |
| 5) **Return Address Resolution** | • Invalid address (ZIP+4 Directory) | Bi-Tonal | Moderate | Moderate |
| | • Invalid address (DPF Directory) | Bi-Tonal | High | High |
| | • Non-local return address | Bi-Tonal | Low (HW)<br>Moderate (MP) | Moderate (HW)<br>High (MP) |
| | | Bi-Tonal | High | High |
| | • Postal Code (Zip) Match (against a list of ZIPS) | Bi-Tonal | Low (HW)-5 digits<br>Moderate (MP)to High - 11 digits | High |
| | | | | |
| 6) **Envelope Size & Skew** | • Envelope Length<br>• Envelope Height | Bi-Tonal | High | High |

| Characteristic | Categories | Image Type | Detection Rate | Accuracy |
|---|---|---|---|---|
| | • Envelope Skew | Bi-Tonal | Moderate | Moderate |
| 7) **Postage Characteristics** | • Postage Type (Stamp, Metered, Pre-printed, Embossed) | Gray | Moderate | Moderate |
| | • Excessive Postage | Bi-Tonal | Moderate | Moderate |
| | | Gray | High | High |
| 8) **Restrictive Markings** | Configurable list of keywords ("Personal", "Confidential", etc.) | Bi-Tonal | Low (HW) Moderate (MP) | Moderate (HW) High (MP) |
| 9) **Clear Area Infringement** | • Destination Address Infringement | Gray | Moderate | Low |
| | • Stain | Bi-Tonal | Low | Low |
| | | Gray | Moderate | Moderate |
| 10) **Handwriting Matching** | Similarity score (degree of similarity to image of evidence mail) | | | |

Table Legend:

Image Type: Type of image required to support detection of the image characteristic:

Bi-tonal:        Current bi-tonal images of the front of the envelope are usable

Gray:        Grayscale images required

Color:        Color images required


Detection Rate: An estimate of the frequency of false negatives - instances where a mail piece exhibits the characteristic but the system fails to detect and indicate it:

Low        UP to 25% false negatives

Moderate        Up to 15% false negatives

High        Up to 5% false negatives

Very High        Approximately 1% - 2% false negatives


Accuracy: An estimate of the frequency of false positives -- instances where the system incorrectly indicates that the characteristic is exhibited by the mail piece

Low:        Up to 25% false positives

Moderate:        Up to 5% false positives

High:        Approximately 1% - 2% false positives


Please replace paragraph 44 in the specification with the following amended paragraph 44.


[0044] Figure 5 indicates an embodiment in which the Handwriting Matching software is utilized to pre-process samples of a person's handwriting to extract distinguishing characteristics, then is utilized to identify other mail pieces penned by the same individual. Referring to Figure 5, a handwriting sample 300 from one individual is processed by means of a handwriting profiling method 310 and the distinguishing handwriting characteristics for that individual 320 are included in the profile. A hand addressed mail piece is imaged and the image 305 and the handwriting characteristics are obtained for that image 315. The handwriting characteristics are obtained for that image 315 are compared to the distinguishing handwriting characteristics for that individual 320 and

mail piece is identified for special processing 350, if the distinguishing handwriting characteristics for that individual [[320]] 330 substantially match 340 the handwriting characteristics are obtained for that image 315.

## Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the application:

## Listing of claims

Claim 1: (currently amended) A method for identifying mail pieces for special processing based upon predetermined characteristics, the method comprising the steps of:

a) storing a plurality of predetermined profiles, each of the predetermined profiles having at least one profile image characteristic;

b) obtaining at least one mail piece image characteristic [[for]] associated with an image of a mail piece;

c) retrieving one of the predetermined profiles that has not yet been used in a comparison;

d) comparing the at least one mail piece image characteristic for the image of the mail piece to the at least one profile image characteristics characteristic present in the one of the predetermined profiles;

e) identifying the mail piece for special processing, if the at least one profile image characteristic present in the one of the predetermined profiles substantially matches the at least one mail piece image characteristic for the image of the mail piece.; and

f) repeating steps c) through e) for another one of the plurality of predetermined profiles, if the at least one profile image characteristic does not substantially match the at least one mail piece image characteristic.

Claim 2: (cancelled)

Claim 3: (currently amended) The method of claim 1 wherein the step of comparing the at least one mail piece image characteristic for the image of the mail piece to the at least one profile image characteristic present in the one of the predetermined profiles occurs during real-time processing.

Claim 4: (currently amended) The method of claim 1 wherein the step of comparing the at least one mail piece image characteristic for the image of the mail piece to the at least one profile image characteristic present in the one of the predetermined profile occurs during offline processing.

Claim 5: (currently amended) The method of claim 1 wherein the at least one mail piece image characteristic and the at least one profile image characteristic are [[is]] selected from the group consisting of barcodes, address styles, address resolution, envelope size, initiating processing and distribution center, addressee, postage characteristics, markings, and handwriting characteristics.

Claim 6: (currently amended) A system enabling identification of mail pieces based upon predetermined characteristics, the system comprising:

means for obtaining an image of a mail piece;

means for obtaining at least one mail piece image characteristic associated with [[for]] the image of the mail piece;

at least one processor;

at least one computer readable memory having:

(a) a database storing data for each one of a plurality of predetermined profiles, the data comprising:

an identifier,

at least one profile image characteristic, and,

an action identifier; and,

(b) computer readable code embodied in the at least one computer readable memory, the computer readable code capable of causing the at least one processor to:

retrieve the data for one of the plurality of predetermined profiles from the database,

compare the at least one mail piece image characteristic for the image of the mail piece to the at least one profile image characteristic from the retrieved data,

identify the mail piece as requiring the action identified by the action identifier from the retrieved data, if the at least one mail piece image characteristic present in the

retrieved data substantially matches the at least one <u>profile</u> image characteristic from

the retrieved data.

Claim 7: (currently amended) The system of claim 6 wherein the computer readable code is further

capable of causing the at least one processor to:

retrieve the data corresponding to another predetermined profile from the plurality of

predetermined profiles from the database,

compare the at least one <u>mail piece</u> image characteristic for the image of the mail piece to the

at least one <u>profile</u> image characteristic from the retrieved data,

identify the mail piece as requiring the action identified by the action identifier from the

retrieved data, if the at least one <u>profile</u> image characteristic from the retrieved data substantially

matches the at least one <u>mail piece</u> image characteristic for the image of the mail piece.

Claim 8: (original) The system of claim 6 further comprising:

means for communicating with a network.

Claim 9: (original) The system of claim 8 further comprising:

a remote server capable of receiving and sending data.

Claim 10: (currently amended) The system of claim 7 wherein the at least one <u>mail piece</u> image

characteristic <u>and the at least one profile image characteristic are</u> [[is]] selected from the group

consisting of barcodes, address styles, address resolution, envelope size, initiating processing and

distribution center, addressee, postage characteristics, markings, and handwriting characteristics.

Claim 11: (currently amended) A system enabling identification of mail pieces based upon

predetermined characteristics, the system comprising:

means for obtaining an image of a mail piece;

means for obtaining at least one <u>mail piece</u> image characteristic <u>associated with</u> [[for]] the

image of the mail piece;

at least one processor;

a first memory for storing data for access by a process executed by at least one processor, said memory comprising:

a database storing data for each one of a plurality of predetermined profiles, the data comprising:

an identifier,

at least one profile image characteristic, and,

an action identifier;

at least one second memory having computer readable code embodied therein, the computer readable code capable of causing the at least one processor to:

retrieve the data for one of the plurality of predetermined profiles from the database,

compare the at least one mail piece image characteristic ~~for the image of the mail piece~~ to the at least one profile image characteristic from the retrieved data,

identify the mail piece as requiring the action identified by the action identifier from the retrieved data, if the at least one mail piece image characteristic present in the retrieved data substantially matches the at least one profile image characteristic from the retrieved data.

Claim 12: (currently amended) The system of claim 11 wherein the computer readable code is further capable of causing the at least one processor to:

retrieve the data corresponding to another predetermined profile from the plurality of predetermined profiles from the database,

compare the at least one mail piece image characteristic for the image of the mail piece to the at least one profile image characteristic from the retrieved data,

identify the mail piece as requiring the action identified by the action identifier from the retrieved data, if the at least one profile image characteristic from the retrieved data substantially matches the at least one mail piece image characteristic for the image of the mail piece.

Claim 13: (original) The system of claim 11 further comprising:

means for communicating with a network.

Claim 14: (original) The system of claim 13 further comprising:

a remote server capable of receiving and sending data.

Claim 15: (currently amended) The system of claim 11 wherein the at least one <u>mail piece</u> image characteristic <u>and the at least one profile image characteristic are</u> [[is]] selected from the group consisting of barcodes, address styles, address resolution, envelope size, initiating processing and distribution center, addressee, postage characteristics, markings, and handwriting characteristics.

Claim 16: (currently amended) The system of claim 14 wherein the remote server includes[[ ]]:

at least one third memory having computer readable code embodied therein, the computer readable code capable of causing the at least one processor to:

retrieve the data for one of the plurality of predetermined profiles from the database,

compare the at least one <u>mail piece</u> image characteristic <u>associated with</u> [[for]] the image of the mail piece to the at least one <u>profile</u> image characteristic from the retrieved data,

identify the mail piece as requiring the action identified by the action identifier from the retrieved data, if the at least one <u>mail piece</u> image characteristic present in the retrieved data substantially matches the at least one <u>profile</u> image characteristic from the retrieved data.

Claim 17: (currently amended) The system of claim 16 wherein the computer readable code is further capable of causing the at least one processor to:

retrieve the data corresponding to another predetermined profile from the plurality of predetermined profiles from the database,

compare the at least one <u>mail piece</u> image characteristic for the image of the mail piece to the at least one <u>profile</u> image characteristic from the retrieved data,

identify the mail piece as requiring the action identified by the action identifier from the retrieved data, if the at least one <u>profile</u> image characteristic from the retrieved data substantially matches the at least one <u>mail piece</u> image characteristic for the image of the mail piece.

Claim 18: (currently amended) The system of claim 14 further comprising[[ ]]:

<u>another</u> [[a fourth]] memory for storing data for access by a process executed by the remote server, said memory including a database.

Claim 19: (currently amended) The method of claim 1 wherein the mail piece comprises a hand addressed mail piece;

wherein the at least one mail piece image characteristic comprises at least one handwriting characteristic; and,

wherein said one of the predetermined profiles comprises at least one distinguishing handwriting characteristic for handwriting penned by one individual.

Claim 20: (currently amended) The system of claim 6 wherein the mail piece comprises a hand addressed mail piece;

wherein the at least one mail piece image characteristic comprises at least one handwriting characteristic; and,

wherein said one of the predetermined profiles comprises at least one distinguishing handwriting characteristic for handwriting penned by one individual.

Claim 21: (currently amended) The system of claim 11 wherein the mail piece comprises a hand addressed mail piece;

wherein the at least one mail piece image characteristic comprises at least one handwriting characteristic; and,

wherein said one of the predetermined profiles comprises at least one distinguishing handwriting characteristic for handwriting penned by one individual.

Claim 22: (currently amended) A system for processing mail items and identifying mail items for special processing comprising:

a transport sub-system capable of transporting a mail item;

an imaging sub-system capable of obtaining an image of the mail piece;

means for storing a plurality of predetermined profiles, each of the predetermined profiles having at least one profile image characteristic;

means for obtaining at least one mail piece image characteristic associated with [[for]] an image of the mail piece;

means for retrieving ~~one of~~ the <u>plurality of</u> predetermined profiles;

means for <u>successively</u> comparing the at least one <u>mail piece</u> image characteristic ~~for the image of the mail piece~~ to the at least one <u>profile</u> image <u>characteristic</u> ~~characteristics~~ present in ~~the one~~ <u>any</u> of the <u>plurality of</u> predetermined profiles <u>until a match is found, if any</u>;

means for identifying the mail piece for special processing, if the at least one <u>profile</u> image characteristic present in [[the]] one of the <u>plurality</u> predetermined profiles substantially matches the at least one <u>mail piece</u> image characteristic for the image of the mail piece.

Claim 23: (currently amended) The system of claim 22 further comprising:

~~means for retrieving the data corresponding to another predetermined profile from the plurality of predetermined profiles from the database,~~

~~means for comparing the at least one image characteristic for the image of the mail piece to the at least one image characteristic from the retrieved data,~~

means for identifying the mail piece as requiring [[the]] <u>an</u> action identified by [[the]] <u>an</u> action identifier from the retrieved [[data]] <u>other of the predetermined profiles,</u> if the at least one <u>profile</u> image characteristic from the retrieved data substantially matches the at least one <u>mail piece</u> image characteristic for the image of the mail piece.

Claim 24: (currently amended) The system of claim 22 wherein the at least one <u>mail piece</u> image characteristic <u>and the at least one profile image characteristic are</u> [[is]] selected from the group consisting of barcodes, address styles, address resolution, envelope size, initiating processing and distribution center, addressee, postage characteristics, markings, and handwriting characteristics.

Claim 25: (original) The system of claim 22 further comprising:

means for communicating with a network.

Claim 26: (original) The system of claim 25 further comprising:

a remote server capable of receiving and sending data.

Claim 27: (currently amended) The system of claim 22 wherein the mail piece comprises a hand addressed mail piece;

wherein the at least one mail piece image characteristic comprises at least one handwriting characteristic; and,

wherein said one of the predetermined profiles comprises at least one distinguishing handwriting characteristic for handwriting penned by one individual.


Claim 28: (new) The system of claim 8 wherein said database is downloaded from the network.


Claim 29: (new) The method of claim 1 further comprising the steps of:

modifying a result record associated with the image of the mail piece if the mail piece is flagged for the special processing;

transmitting the image to a remote site for manual image inspection according to the result record; and

classifying the mail piece as innocuous or suspicious based on the manual image inspection.


Claim 30: (new) The method of claim 1 further comprising the steps of:

g) archiving the mail image having at least one archived mail piece image characteristic;

h) updating the plurality of predetermined profiles by creating at least one new or one updated predetermined profile having at least one new profile image characteristic;

i) retrieving one of the new or updated predetermined profiles that has not yet been used in the comparison;

j) comparing the at least one archived mail piece image characteristic to the at least one new profile image characteristic present in the one new or one updated predetermined profile;

l) identifying the archived mail piece for the special processing, if the at least one new profile image characteristic substantially matches the at least one archived mail piece image characteristic; and

m) repeating steps (i) through (l) for another one of the plurality of new or updated predetermined profiles, if the at least one new profile image characteristic does not substantially match the at least one archived mail piece image characteristic.

## REMARKS

The Office Action of November 22, 2006 has been carefully reviewed and this response addresses the Examiner's concerns stated in the Office Action. Applicants appreciate the Examiner's careful examination of the application.

## I. STATUS OF THE CLAIMS

Claims 1, 3-30 are pending in the application.

Independent claims 1, 6, 11, and 22 have been amended to further define the invention. No new matter has been added.

Dependent claims 3-5, 7, 10, 12, 15-21, 23, 24, and 27 have been amended to clarify and make consistent their terminology. Claims 19-21 and 27 have been amended to further define the invention. No new matter has been added.

Dependent claim 2 has been cancelled without prejudice.

Dependent claims 28-30 have been added. Support for dependent claim 28 can be found in Applicants' Specification, paragraph 21. Support for dependent claim 29 can be found in Applicants' Specification, paragraphs 28-31. Support for dependent claim 30 can be found in Applicants' Specification, paragraphs 32-35. No new matter has been added.

Claims 5-21, 23, 24, and 27 were rejected under 35 U.S.C. § 112, second paragraph.

Claims 1-3, 5-15, 18, and 22-26 were rejected under 35 U.S.C. § 102(e) as being anticipated by Ryan, Jr. et al., United States Patent # 7,071,437, issued on July 4, 2006, published on July 3, 2003, filed on December 31, 2001 (Ryan). Applicants respectfully point out that Ryan was

published within a year of Applicants' filing date, October 30, 2003. Applicants reserve the right to swear behind Ryan.

Claim 4 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ryan in view of Lopez, United States Patent Application # 2002/029,202, published on March 7, 2002, filed on December 13, 2000 (Lopez).

Claims 16 and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ryan in view of Bloomfield, United States Patent # 6,025,931, issued February 15, 2000 (Bloomfield).

Claims 19-21 and 27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ryan in view of Kagehiro et al., United States Patent # 6,246,794, issued June 12, 2001 (Kagehiro).

The drawings were objected to as failing to comply with 37 C.F.R. § 1.84(p)(5). Applicants herein submit corrected drawings for Figures 3, 6, and 7.

The specification was objected to because of several informalities. Applicants herein submit a response to the objections.

II. OBJECTIONS TO THE DRAWINGS

On page 2, in paragraph 1, the Office Action states that the drawings are objected to under 37 C.F.R. § 1.84(p)(5) because they do not include reference numbers 160 and 260. Applicants herein submit Replacement Sheets for Figures 6 and 7, which now contain reference numbers 160 and 260 respectively. No new matter has been added.

On page 2, in paragraph 2, the Office Action states that the drawings are objected to as failing to comply with 37 C.F.R. § 1.84(p)(5) because they include reference numbers that are not referred to in the specification: reference numbers 30 and 65 in Figure 1, reference numbers 8, 12, and 15 in Figure 3, and reference number 340 in Figure 5. Applicants have amended the specification,

paragraphs 21 (reference numbers 8, 12, 15, 30 and 65) and 44 (reference number 340), to include the omitted reference numbers. No new matter has been added.

On page 2, in paragraph 3, the Office Action states that the drawings are objected to because Figure 3 should have reference numbers for each block to provide consistency. Applicants herein submit a Replacement Sheet for Figure 3, which now contains additional reference numbers 22, 24, 26, 28, 32, 34, and 60, which are also referred to in the specification in amended paragraph 27 (reference number 26), paragraph 28 (reference numbers 28 and 34), and paragraph 39 (reference numbers 22, 24, and 32). Reference number 60 had previously been referenced in paragraph 21, and thus no amendments to the specification to accommodate reference number 60 are required. No new matter has been added.

III. OBJECTIONS TO THE SPECIFICATION

On page 3, in paragraph 4, the Office Action states that the specification is objected to because of informalities on pages 1 (lines 1 and 2), 15 (Table 1), 21 (paragraph 3), 24 (Table 2), 25 (Table 2), 26, (table 2), and 28 (paragraph 44).

Applicants respectfully point out that pages 1, 15, 24, 25, and 26 do not contain errors on Applicants' as-filed specification. See the attached pages. With respect to page 2, top line, there is no new paragraph. Paragraph [0004] begins on page 1 as shown in the attachment. Applicants have amended paragraphs 39 (page 21, paragraph 3) and 44 (page 28) to correct reference number and figure number inaccuracies. No new matter has been added.

IV. REJECTIONS UNDER 35 U.S.C. § 112

On pages 4-6, in paragraphs 5-6, the Office Action states that claims 5-21, 23, 24, and 27 are rejected under 35 U.S.C. § 112, second paragraph.

With respect to claims 5, 10, 15, and 24, the Office Action states that the limitation "wherein the at least one image characteristic is selected" renders the claim indefinite because it is unclear which image characteristic is being mentioned or referred to. The Office Action has interpreted this clause as follows: "wherein the at least one image characteristic for the image of the mail piece and for one of the predetermined profiles is selected". Applicants have amended dependent claims 5, 10, 15, and 24 to clarify the terminology. No new matter has been added.

With respect to claims 6, 11, and 16 and their dependent claims, the Office Action states that the limitation "if the at least one image characteristic present in the retrieved data substantially matches the at least one image characteristic from the retrieved data" renders these claims indefinite because a comparison between two same components is being made. Applicants have amended claims 6, 11, and 16 to clarify the terminology. No new matter has been added.

With respect to claim 18, the Office Action states that the limitation "a fourth memory" renders this claim indefinite because a third memory is not mentioned in its preceding claims. Applicants have amended claim 18 to clarify the terminology. No new matter has been added.

With respect to claims 19, 20, 21, and 27, the Office Action states that the limitation "wherein the at least one image characteristic comprises" renders these claims indefinite because it is unclear which image characteristic is being mentioned or referred to. Applicants have amended claims 19-21 and 27 to clarify the terminology. No new matter has been added.

With respect to claim 23, the Office Action states that the limitations "retrieving the data", "profiles from the database", and "identified by the action identifier" have insufficient antecedent basis. Applicants have amended claim 23 to correct the antecedent basis. No new matter has been added.

V. REJECTIONS UNDER 35 U.S.C. § 102

On pages 6-12, in paragraphs 7-8, the Office Action states that claims 1-3, 5-15, 18, and 22-26 are rejected under 35 U.S.C. § 102(e) as being unpatentable over Ryan.

Applicant respectfully points out that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628 (CAFC, 1987), M.P.E.P. § 2131. As provided by the remarks set forth below, clearly this is not the case with the present rejection of the claims.

Independent claims 1 and 22 have been amended to incorporate the limitations stated in dependent claims 2 and 23 respectively. No new matter has been added.

It is submitted that amended independent claims 1 and 22 are not anticipated by Ryan because Ryan does not teach Applicants' claimed repeating steps (c) through (e) for another one of the plurality of predetermined profiles, if the at least one profile image characteristic does not substantially match the at least one mail piece image characteristic. More specifically, Ryan does not teach Applicants' claimed invention because (1) Ryan does not disclose a plurality of predetermined profiles, and (2) Ryan's analysis with respect to Ryan's suspect database terminates after a single comparison because there is no plurality of predetermined profiles with which Ryan can perform successive comparisons. Ryan cannot make subsequent comparisons to the suspect database because the suspect database contains Ryan's stated criteria (Ryan, col. 5, lines 20-65) and the comparison software labels a mail piece suspect if the mail piece satisfies a certain percentage of those criteria (Ryan, col. 12, lines 18-24). Applicants, on the contrary, claim repeating the comparison between mail piece image characteristics and profile image characteristics for another of Applicants' claimed predetermined profiles if the mail piece and profile image characteristics don't match. Ryan teaches neither multiple profiles nor multiple comparisons for the same mail piece.

Dependent claim 2 has been cancelled without prejudice.

It is submitted that dependent claims 3 and 5 are patentable at least by virtue of their dependence upon amended independent claim 1.

It is submitted that independent claims 6 and 11 are not anticipated by Ryan because Ryan does not teach Applicants' claimed data for a predetermined profile comprising an action identifier. Ryan does not teach Applicants' claimed action identifier (see Applicants' Specification, paragraph 24, for an example of a profile and an action associated with the profile, and paragraph 46 for a description of the contents of a profile) because Ryan simply states a list of suspect criteria (Ryan,

col. 5, lines 20-65), and then later refers to these criteria as a suspect database (Ryan, col. 12, line 15), but provides no other details about the suspect database. Further, Ryan provides no reason for Applicants' claimed action identifier because Ryan states a single action when a suspect mail piece is found: divert the suspect mail piece to a diverter collection module (Ryan, FIG. 9c, steps 210 and 212).

It is submitted that dependent claims 7 and 12 are not anticipated by Ryan for the same reasons stated with respect to amended independent claims 1 and 22. Ryan does not teach Applicants' claimed another predetermined profile, nor does Ryan teach Applicants' claimed computer readable code that causes a processor to compare the mail piece characteristics to data from the another predetermined profile because Ryan has a single list of criteria which are compared against a single mail piece, and the mail piece is either diverted or not. In Applicants' system, readable code performs multiple comparisons against a single mail piece, which Ryan does not teach.

It is submitted that dependent claims 8, 9, 10, 13, 14, 15, 18, 24, 25, 26 are patentable at least by virtue of their selective direct or indirect dependence upon amended independent claims 6, 11, and 22.

It is submitted that dependent claim 23 is not anticipated by Ryan for the same reasons as stated with respect to independent claims 6 and 11.

Since Ryan does not teach each and every element of Applicants' amended independent claims 1, 6, 11, and 22 and claims 3-5, 7-10, 12-21, and 23-28 which depend selectively therefrom, Applicants' amended independent claims 1, 6, 11, and 22 and dependent claims 3-5, 7-10, 12-21, and 23-28, are not anticipated by Ryan, and a rejection under 35 U.S.C. § 102(e) is inappropriate. Further, it is submitted that amended independent claims 1, 6, 11, and 22 and dependent claims 3-5, 7-10, 12-21, and 23-28 are not made obvious by Ryan under 35 U.S.C. § 103. Applicants assert that amended independent claims 1, 6, 11, and 22 and dependent claims 3-5, 7-10, 12-21, and 23-28, are now in condition for allowance. Applicants respectfully request the withdrawal of the rejection under 35 U.S.C. § 102(e) with regards to amended independent claims 1, 6, 11, and 22 and claims 3-5, 7-10, 12-21, and 23-28, for the reasons set forth above.

VI. REJECTIONS UNDER 35 U.S.C. § 103

On pages 12-13, in paragraphs 9-10, the Office Action states that dependent claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Ryan in view of Lopez.

It is submitted that amended dependent claim 4 is not obvious in view of Ryan and Lopez because neither Ryan nor Lopez nor their combination discloses or suggests Applicants' claimed step of repeating steps (c) through (e) for another one of the plurality of predetermined profiles, if the at least one profile image characteristic does not substantially match the at least one mail piece image characteristic. As stated previously with respect to independent claims 1 and 22, Ryan lacks this step. Lopez does not make up Ryan's deficiency because Lopez performs certain steps on-line, and a different set of steps off-line, neither of which include comparing a particular mail piece against multiple profiles.

On pages 13-14, in paragraph 11, the Office Action states that dependent claims 16 and 17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ryan in view of Bloomfield.

It is submitted that dependent claims 16 and 17 are not obvious in view of Ryan and Bloomfield because neither Ryan nor Bloomfield nor their combination discloses or suggests Applicants' claimed remote server having computer readable code that identifies the mail piece as requiring the action identified by the action identifier from the retrieved data. Ryan does not disclose Applicants' claimed remote server having computer readable code that includes an action identified by the action identifier from the retrieved data for the reasons stated previously with respect to independent claims 6 and 11. Bloomfield does not make up for Ryan's deficiency because Bloomfield simply forwards e-mail (Bloomfield, col. 7, lines 49-59) without reference to any sort of action identifier in a profile database.

On pages 15-16, in paragraph 12, the Office Action states that dependent claims 19-21 and 27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ryan in view of Kagehiro.

Dependent claims 19-21 and 27 have been amended to further define the invention. Support for the amendment can be found in Applicants' Specification, paragraph 44.

It is submitted that amended dependent claims 19-21 and 27 are not obvious in view of Ryan and Kagehiro. Neither Ryan nor Kagehiro nor their combination discloses or suggests Applicants' claimed one of the predetermined profiles comprises at least one distinguishing handwriting

characteristic for handwriting penned by one individual.   Ryan does not disclose or suggest Applicants' claimed at least one distinguishing characteristic for handwriting penned by one individual because Ryan's criteria (Ryan, col. 5, lines 21-65) are general and apply to all individuals, but not Applicants' claimed handwriting penned by one individual.  Kagehiro does not make up Ryan's deficiency because Kagehiro states a system in which individual characters are disambiguated, but there is no connection between an individual and the characters stated in Kagehiro that would, combined with Ryan, make obvious Applicants' claimed at least one distinguishing handwriting characteristic for handwriting penned by one individual.

Since none of Ryan, Lopez, Bloomfield, or Kagehiro, either individually or in combination, teach or suggest each and every element of Applicants' dependent claims 4, 16, 17, 19-21, or 27, Applicants' dependent claims 4, 16, 17, 19-21, or 27, are not made obvious by Ryan, Lopez, Bloomfield, and Kagehiro, and a rejection under 35 U.S.C. § 103(a) is inappropriate.  Applicants assert that dependent claims 4, 16, 17, 19-21, or 27, are now in condition for allowance.  Applicants respectfully request the withdrawal of the rejection under 35 U.S.C. § 103(a) with regards to dependent claims 4, 16, 17, 19-21, or 27, for the reasons set forth above.

VII. CONCLUSION

Amended independent claims 1, 6, 11, and 22 are believed to be in condition for allowance for the reasons provided herein. It is submitted that dependent claims 3-5, 7-10, 12-21, and 23-28, are also allowable for the reasons presented above, and further because they depend upon independent claims which are believed to be in condition for allowance, and are therefore also believed to be in condition for allowance.
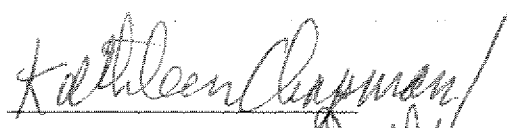
One dependent claim, claim 2, has been cancelled, and three dependent claims, claims 28-30, have been added. The Commissioner for Patents is authorized to charge additional fees, in particular the large entity fee of $100 for two additional dependent claims over twenty, or credit overpayment to Deposit Account No. 03-2410, Order No. 12078-194.

The following information is presented in the event that a call may be deemed desirable by the Examiner: Kathleen Chapman (617) 345-3210

Respectfully submitted,

Alfred T. Rundle et al., Applicants

Date: February 22, 2007

By: Kathleen Chapman

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